Madroño, Vol. 56, No. 2, pp. 104–111, 2009

NOTES ON CALIFORNIA MALVACEAE INCLUDING NOMENCLATURAL CHANGES AND ADDITIONS TO THE FLORA

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Abstract

The writing of revised treatments for selected California Malvaceae for the upcoming second edition of the *Jepson Manual* and the *Flora of North America* series (volume 6) has made several nomenclatural changes and explanations necessary. New combinations are made here for taxa in *Sidalcea*, including *Sidalcea asprella* subsp. *nana*, *Sidalcea calycosa* subsp. *rhizomata*, *Sidalcea celata*, and *Sidalcea sparsifolia*. Several taxa previously included within *Sidalcea malviflora* have been removed from that species and re-interpreted, resulting in the resurrection and acceptance of the names *Sidalcea asprella* Greene and *Sidalcea elegans* Greene. Comments are presented here on the status of *Hibiscus lasiocarpos* and *Lavatera* vs. *Malva* in the California flora. At least one native species has been added to the flora, namely, *Iliamna rivularis*, though it may no longer occur in the state. Four species of Malvaceae have become naturalized or have been found as waifs in recent years and are added to the flora, namely, *Anoda pentaschista*, *Lagunaria patersonia*, *Lavatera olbia*, and *Lavatera trimestris*.

Key Words: California, *Hibiscus*, *Lagunaria*, *Lavatera*, *Malva*, Malvaceae, North America, *Sidalcea*.

The preparation of revised treatments of several genera of California Malvaceae for the upcoming revision of the *Jepson Manual—Higher Plants of California* (TJM1=Hickman 1993) and for the new *Flora of North America, Volume 6* (in preparation) led to the need for several nomenclatural changes as well as an explanation for some of the changes as compared to previous treatments (e.g., Hill 1993). In addition, several taxa have been noted that were not included in TJM1 for the flora of California. Newly described taxa in *Sidalcea* have been or shall be published elsewhere (Hill 2008; Clifton, Buck and Hill unpublished).

New Combinations and Interpretations in *Sidalcea*

Sidalcea A.Gray is the most species-rich of the genera of Malvaceae in California and it is a near-endemic there. It is also one of the most perplexing of the genera taxonomically, and while several attempts have been made to better define the taxa (Roush 1931; Hitchcock 1957; Dimling 1991; Hill 1993; Andreasen and Baldwin 2001, 2003a, b; Andreasen 2005), some remain difficult to delineate. The treatment by Hitchcock (1957) attempted a synthesis using phytogeographic, morphological, and chromosomal data, and he utilized four ranks: genus, species, subspecies, and variety in an attempt to sharply define the variants. An examination of his treatment revealed that most species, subspecies, and varieties that he described were said to have transitional individuals to other taxa, and in some groups of species it was nearly impossible to identify many of the individuals conclusively. His hand-written notes on specimens in some herbaria also revealed his frustration with these plants (e.g., on *Blankinship s.n.*, JEPS 2856, the type of *Sidalcea malviflora* (DC.) A. Gray var. *celata* Jeps., C. L. Hitchcock wrote: "*S. malvaeflora* ssp. *celata*—unless I find cause for changing my opinion", and on JEPS 2855: "*S. malvaeflora* ssp. *celata*—I believe I shall call this").

A previous treatment of the genus in California (Hill 1993) attempted to make some sense of the species, but it tended to err on the side of combining variants rather than recognizing them to reduce the number of names. After working several more years with these species as well as with many more both new and old collections, I have attempted to clarify some of the problems created by combining the variants. Admittedly, the changes still have not resulted in a 'perfect' treatment by any means, but my first goal has been to re-interpret some of the variants. The changes in interpretation are supported by both morphological and geographic consistency after a reexamination of type and additional material. Second, the work of Andreasen and Baldwin (2001, 2003a, b) and Andreasen (2005) utilizing new molecular phylogenetic data has helped to clarify some of the relationships within the genus since the 1993 treatment, and a goal was to reposition and rename some taxa to incorporate some of the major changes suggested by the molecular work. Among the hypotheses supported by the new data are the following: 1) the basal perennials are *Sidalcea hickmanii* Greene, *S. malachroides* (Hook. & Arn.) A. Gray, and *S. stipularis* J. T. Howell & True, 2) four lineages, or

clades, of the remaining perennial species appear to be well-supported, the '*malviflora* clade', the '*oregana* clade', the '*glaucescens* clade', and the '*asprella* clade', 3) within the *malviflora* clade, the primarily coastal subspecies of *Sidalcea malviflora* (subsp. *malviflora*, subsp. *laciniata* C. L. Hitchc., subsp. *patula* C. L. Hitchc., subsp. *purpurea* C. L. Hitchc., and subsp. *rostrata* (Eastw.) Wiggins) form a very coherent and closely related group, whereas the somewhat more interior subsp. *sparsifolia* C. L. Hitchc. and subsp. *californica* (Torr. & A. Gray) C. L. Hitchc. (and subsp. *dolosa* C. L. Hitchc. ?) are somewhat divergent from those, and 4) the plants treated as *S. malviflora* subsp. *asprella* (Greene) C. L. Hitchc. in the 1993 revision are not in the same lineage, or clade, as the other subsp. of *S. malviflora*, nor are they all necessarily very close to each other, but, instead, are more closely related to the mountain species *S. glaucescens* Greene and the foothill species *S. robusta* Heller ex Roush. While several additional working hypotheses can be derived from the molecular work, these four, especially the latter three, would seem to affect the classification and nomenclature of the California perennials the most. The inland, mostly mountain plants that had been tossed into the 'dust bin' of *Sidalcea malviflora* subsp. *asprella* had to be reassessed, and this has been the emphasis in the recent studies.

Hitchcock (1957) considered *Sidalcea malviflora* ['*malvaeflora*'] to be a single widespread species ranging from Baja California, Mexico, north to the Willamette Valley of Oregon, and he divided it into 12 rather geographically coherent subspecies, some of which were subdivided into varieties. Eleven of the subspecies were recognized in California, subsp. *virgata* (Howell) C. L. Hitchc. of Oregon being the only exception. Hill (1993) reduced the number of California subspecies to eight, combining Hitchcock's subsp. *celata*, *elegans*, and *nana* into the single Sierran subsp. *asprella* partly because of the numerous comments on transitional individuals in Hitchcock's 1957 revision. Over the years since, and after the examination of many more collections, it was decided that this subspecies circumscription has become far too broad to be useful, and refinement has been attempted.

This group of difficult variants resides primarily in Andreasen and Baldwin's (2003a, b) '*asprella* clade'. Regarding this '*asprella* clade', Hitchcock's treatment and keys were generally unusable. Plants of very different appearance from distant geographical areas and habitats would often key to the same subspecies. Andreasen and Baldwin (2003a, b) demonstrated that the Hill (1993) concept of subsp. *asprella* was actually polyphyletic, and their different samples of that subspecies did not cluster together in the final analysis.

Inheriting this problem, I decided to start over and reexamine the type specimens in the group, keeping this new molecular data result always in mind. Within this group, a new and undescribed species of *Sidalcea* had also been brought to my attention (Clifton, Buck and Hill unpublished), and studies of this as well as the other entities within the '*asprella*' and '*glaucescens*' clades have helped to resolve the problems to a certain extent. I decided to recognize and describe as best I could the morphologically and geographically distinct taxa that sorted out with the new data. Therefore, I now propose the following nomenclatural and taxonomic changes within *Sidalcea*.

SIDALCEA ASPRELLA Greene subsp. ASPRELLA, Bulletin of the California Academy of Sciences 1:78.1885.—Type: USA, California, Yuba Co., near Camptonville, 1 Jul 1884, *E. L. Greene s.n.* (lectotype, here designated: CAS 1121!). Synonym: *Sidalcea malviflora* ['*malvaeflora*'] (DC.) A. Gray subsp. *asprella* (Greene) C. L. Hitchc., University of Washington Publications in Biology 18:25. 1957.

Edward L. Greene, in describing this species in 1885, cited two specimens, and some of his other remarks (p. 78) bear repeating: "On bushy hillsides of the lower Sierras, just below the habitat of *Chamaebatia*; apparently not collected before last season; found by Mrs. Curran in El Dorado County, and by the writer on Mr. John Ramm's ranch, near Camptonville, in Yuba County. Peculiar, at least among the perennial species, in having the leaves all of precisely the same shape, the lowest and the uppermost differing only in point of size. The rough pubescence is likewise very characteristic." The lectotype shows these features well, as do many other specimens from the Sierras. However, Hitchcock (1957) changed the circumscription of this species to include many plants with hair, habit, and leaf features that did not match the type or Greene's conception. Over the years since, numerous specimens that vary considerably from the original concept have been determined to be this species, and the name has become a 'dustbin' for difficult Sierra plants. While some variation certainly appears to be present, the resurrection and more precise application of Greene's original name, and to a greater extent, his concept of the species, should prove useful for current and future studies.

SIDALCEA ASPRELLA Greene subsp. NANA (Jeps.) S. R. Hill, comb. nov.—*Sidalcea reptans* var. *nana* Jeps., Flora of California, 2:489. 1936.—Type: USA, California, Trinity Co., Soldier's Ridge, SE Trinity Co. (Yollo Bolly Mountains), 24 Jul 1897, *W. L. Jepson 14061* (holotype: JEPS 2856!; isotype: JEPS 2858!). Synonym: *Sidalcea malviflora* ['*malvaeflora*']

subsp. *nana* (Jeps.) C. L. Hitchc., University of Washington Publications in Biology 18:29. 1957.

Willis L. Jepson, in describing this as a variety in 1936, considered it to be a close relative of *Sidalcea reptans* Greene because of its very long thin rhizomes. The specimens on the type sheet are dwarfed, and all of the inflorescences are <10 cm long. Not all specimens are as small as the type—instead, robust individuals can reach a height of as much as 40 cm, yet they still share the other important diagnostic characters. The morphological features match those of *S. asprella* subsp. *asprella* well, but the subspecies is distinctive in its long slender rooting rhizomes and its fewer-flowered, often short inflorescences and occasionally few-leaved (1–3) stems that are decumbent-based. Otherwise the hairs throughout and toothed leaf lobes are a close match to *S. asprella* subsp. *asprella*. Studies by Andreasen and Baldwin (2003a, b) show this plant to be, perhaps, closer to *S. glaucescens* than *S. asprella*, but more samples are needed to test this as the morphology does not support this placement (e.g., *S. glaucescens* and the very similar *S. multifida* Greene do not have elongated rooting rhizomes of any kind). Certainly this subspecies, as well as the typical subspecies, can no longer be included within the more coastal *S. malviflora* based upon the molecular data, and so a new name was needed.

SIDALCEA CALYCOSA subsp. RHIZOMATA (Jeps.) Munz ex S. R. Hill, comb. nov.—*Sidalcea rhizomata* Jeps., Manual of Flowering Plants of California 629. 1925.—Type: USA, California, Marin Co., Point Reyes Peninsula, marsh near Russell's Creamery, 16 Sep 1900, *W. L. Jepson 1174* (holotype: JEPS 2861!; isotypes: JEPS 2859! MO!—not yet accessioned with a number at the time of its inspection).

There are two sheets of the type collection at JEPS; the sheet accessioned as JEPS 2861 has Jepson's handwritten designation as 'type' on it, and includes the fertile material; the duplicate sheet, JEPS 2859, consists of the sterile, creeping, rooting rhizomes with scattered leaves also characteristic of this subspecies. Munz (Munz and Keck 1959 p. 132; Munz 1968 p. 12) used the name "*Sidalcea calycosa* M. E. Jones subsp. *rhizomata* (Jeps.) Munz," but did not validly publish this new combination there or elsewhere. He, perhaps, did not realize that post-1952 new combinations require direct references to the basionyms. Its inclusion here serves to validate the combination.

SIDALCEA CELATA (Jeps.) S. R. Hill, comb. nov. —*Sidalcea malviflora* ['*malvaeflora*'] var. *celata* Jeps., Flora of California 2:493. 1936.—Type: USA, California, Shasta Co., Olinda, 11 May 1911, *J. W. Blankinship s.n.* (holotype: JEPS 2856!; isotype: JEPS 2855!, possibly WIS!—but dated 16 Apr 1911).

The two JEPS specimens are quite different at first glance – JEPS 2856 is a single stem with nicely spread leaves, and JEPS 2855 has 2 stems and a good caudex, but the leaves are badly wrinkled. The two together supply a good series of characters to define the species, however JEPS 2856 bears a label indicating it is the type, and JEPS 2855 bears a label indicating it is an isotype. Both bear several annotation labels by the experts, including C. L. Hitchcock whose comments have been included above. While the lower leaves of the holotype have some resemblance to those of the type of *S. asprella*, other characters do not fit that species; some of the contrasting features include the lack of rhizomes, the presence of stiff reflexed bristle hairs at the base of the stem (a primary character for *S. celata*), and the upper leaves have narrow, often entire lobes, whereas *S. asprella*, as here defined, generally has some short rhizomes, coarse stellate hairs at the stem base, and upper leaves that are somewhat similar to those below, with wider lobes that are generally toothed. Upon using these characters on additional specimens, I discovered that *Sidalcea celata* is a species that is rather narrowly distributed in dry open oak woodlands mostly associated with serpentine in Shasta and adjacent Tehama Cos., whereas *S. asprella* appears to be widely distributed in the central and northern Sierra Nevada range and to the northwest, at the margin of more mesic coniferous woodlands, either associated with serpentine and serpentine-like minerals, or not.

SIDALCEA ELEGANS Greene, Cybele Columbiana 1:35. 1914.—Type: USA, Oregon, Josephine Co., Eight Dollar Mountain, 12 Jun 1904, *C. V. Piper 6171* (holotype: US 527772!; photograph of holotype at MO 940080!). Synonym: *Sidalcea malviflora* ['*malvaeflora*'] (DC.) A. Gray subsp. *elegans* (Greene) C. L. Hitchc., University of Washington Publication in Biology 18:27. 1957.

Sidalcea elegans is rather easily distinguished from the other members of the '*asprella* clade' by means of the relatively long, soft, simple hairs at the base of the stem, sometimes so sparse as to be nearly lacking. The stems are characteristically brittle and easily snapped when fresh, a character not mentioned for other taxa in the genus (but not especially useful on herbarium specimens!). The upper stems are sometimes glaucous, and because of that feature as well as the one-sided inflorescences that are often slightly curved

between the flowers, the long acuminate calyx lobes, and the decumbent stems the species has sometimes been reported as *Sidalcea glaucescens*, a species without the long rooting rhizomes of *S. elegans* and that is not known in Oregon. *Sidalcea elegans* appears to be restricted to serpentine, and it is found in the Klamath Mountains of California and Oregon. Roush (1931) treated this taxon as a synonym of *S. asprella* and Hitchcock (1957) stated that "If *asprella* were to be treated as a species, ssp. *elegans* would best be considered thereunder." In contrast, Dimling (1991) stated "Since this subspecies [*S. malviflora* ['*malvaeflora*'] subsp. *elegans*] is so clearly distinct from *S. malvaeflora* ssp. *asprella*, its taxonomic identity will not be discussed further". Hill (1993) treated it as a synonym of *S. malviflora* ('*malvaeflora*') ssp. *asprella* and left it within that variable complex. In an attempt to clarify its position and nomenclature, the name *Sidalcea elegans* Greene is here resurrected, because the taxon is not a part of *S. malviflora* based on molecular evidence, and because it appears to have several features that separate it easily from *S. asprella*.

SIDALCEA SPARSIFOLIA (C. L. Hitchc.) S. R. Hill, comb. nov.—*Sidalcea malviflora* ['*malvaeflora*'] subsp. *sparsifolia* C. L. Hitchc., University of Washington Publications in Biology 18:32. 1957.—Type: USA, California, Kern Co., 1 mile south of Ft. Tejon, 29 May 1952, *C. L. Hitchcock 19546* (holotype: WTU; isotypes: UTC 88184! DS 368036 at CAS!).

Andreasen and Baldwin (2003b) included this plant in their molecular studies of *Sidalcea*, and found that it grouped generally with the coastal subspecies of *S. malviflora* as well as with *S. covillei* Greene, *S. pedata* A. Gray, and *S. neomexicana* A. Gray. They stated: "The position of *S. malviflora* subsp. *sparsifolia* basally to the clade (jk 76%) consisting of the other subspecies of *S. malviflora* plus *S. pedata* and *S. neomexicana*, provides evidence for the paraphyly of *S. malviflora* and may justify treatment of *S. malviflora* subsp. *sparsifolia* as a separate species". I agree with this, not only because of the molecular data but because of its more inland range and semi-desert habitats, as well as a series of morphological differences. It is rather similar to the other species in the clade particularly in the morphology of the fruits and of the pubescence of its various parts. The reduced stem leaves and shortened rhizomes may be adaptations to its transitional hot and dry desert environment, and it is the southernmost species of the genus in southern California and Baja California, along with its desert wetland-adapted relative *S. neomexicana*.

Extreme variation remains problematic in this species despite its removal from *S. malviflora*. Hitchcock (1957) divided his *Sidalcea malviflora* subsp. *sparsifolia* further into four morphologically defined varieties that also have some geographic coherence. These, upon further study, both morphological and molecular, perhaps could be defined as subspecies of this newly circumscribed species. I have not yet focused on this aspect in the current study, but some of the extremes are not only quite different in appearance, but they are also somewhat difficult to separate from *S. malviflora* subsp. *californica*—another mostly inland taxon that needs additional study.

Sidalcea diploscypha vs. *Sidalcea keckii*

Sidalcea keckii Wiggins has been of special interest in California because it was once thought to have been extirpated (Hill 1993) then, upon being rediscovered at a later date, it was proposed and accepted for inclusion in the Federal Register as a Federally Endangered plant species (United States Fish and Wildlife Service 2000). It was thought to be restricted to the White River region of southern Tulare County. In the years since it was rediscovered, it has been sought out there and elsewhere. It was known since its original description to be very closely related and similar to *Sidalcea diploscypha* (Torr. & A.Gray) A.Gray in its annual habit, its leaf morphology, its flowers and fruits, and especially regarding its pubescence—as only these two annual sidalceas have numerous long fine perpendicular hairs along the stem. The molecular work of Andreasen and Baldwin (2001, 2003b) and especially Andreasen (2005) utilizing new molecular phylogenetic data demonstrated convincingly that the two species are distinct. It has been proposed by some that *S. keckii* is quite recognizable because on the inside of the calyx there are five reddish spots thought not to be present in *S. diploscypha*. A re-investigation of the two species from both old and new herbarium specimens revealed that both species can have these red spots (sometimes reduced to narrow red lines) on the internal calyx surface. Specimens sorted out well using other characters, to the point that it appears that *Sidalcea keckii* is more wide-ranging than previously thought.

Several morphological features can be used to distinguish the two similar species. Regarding the hairs on the stem—one group of specimens (first identified as *S. diploscypha*) had, mixed with the characteristic long perpendicular hairs, a considerable number of glandular hairs and odd multicellular trichomes with green pigment (that resembled short algal filaments) on both the upper stems and on calyces and these were found also on specimens known to be *S. keckii*. This same group of specimens had one or a very few tiny bristles on the upper portion of the fruit

where many sidalceas have a small cusp or mucro (sometimes called a 'beak') whereas *S. diploscypha* has no such bristles on its fruit. The upper leaves of *S. keckii* are not only lobed, typical of both species, but the lobe tips have three equal teeth on the widened lobe apex whereas the lobes of the upper leaves of *S. diploscypha* are usually narrow throughout, and either entire or the lateral teeth are positioned far below the central elongated tooth. The primary difference between the two species is the presence of long, multi-divided bracts and stipules at the base of the flowers and upper leaves, respectively, of *S. diploscypha* vs. the smaller undivided bracts and stipules in the same positions in *S. keckii*. Upon examining a large number of specimens, this feature did hold up well—but there were always a few that did not 'quite fit'—and so a very few specimens with divided bracts were called *S. keckii*. As a result of these character observations, several specimens of *S. diploscypha* from Colusa, Fresno, Merced, Napa, Solano, and Yolo counties were re-annotated as *S. keckii*. Most of these had some features of *S. diploscypha*, and it appeared that introgression might be playing a role. This geographic distribution suggested that specimens of *S. keckii* might also be found in Butte and Lake counties but no specimens examined from those counties had the definitive assemblage of characters of that species and so all were annotated as *S. diploscypha*.

Sidalcea diploscypha appears to be a species that prefers serpentine, whereas *S. keckii* is not so restricted. An examination of habitat and substrate preferences in Napa Co. where both substrates and species have been found nearly side-by-side, showed that those on serpentine sorted out nicely to *S. diploscypha* and those in the adjacent sandstone-derived soils were *S. keckii* though individuals were often only a few meters distant from one another (B. Ertter, [UC/JEPS], J. Ruygt, personal communication). More molecular work on these newly interpreted populations from Solano to Colusa counties may help to further unravel the relationship between these two taxa, but, as interpreted now, the Federally Endangered *S. keckii*, while still exceedingly uncommon, is now reported for seven counties, rather than just one or two, as previously thought. The number of populations currently extant is still unknown. The following key is offered to distinguish the two species:

1a. Upper paired stipules (at petiole bases) and bracts (at pedicel bases) each divided to base into 2 or more linear lobes nearly equal to or longer than calyx; length of central tooth of middle leaf lobe on upper stem leaves much longer than lateral teeth, so lobe has a single apical tooth, or lobes entire; inflorescence, calyx generally not densely glandular . . . . *S. diploscypha*

1b. Upper paired stipules and bracts each simple, linear, undivided (a few divided in robust plants) generally shorter than calyx; length of 3 apical teeth of widened middle leaf lobe on upper stem leaves essentially equal; inflorescence, calyx generally with many minute glandular, multicellular simple hairs . . . . *S. keckii*

Hibiscus lasiocarpos

The California Hibiscus was treated by Hill (1993) as part of the widespread *Hibiscus lasiocarpos* Cav. in accordance with the opinions of Fryxell (1988) and others. The California populations (primarily in the Sacramento Valley) remain quite scarce and isolated from any other populations of this species, the closest of which are in northwestern Chihuahua, Mexico, and in Dona Ana Co., New Mexico. Its scarcity causes it to be of conservation concern in California (List 2: Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere). I have reconsidered this restricted California plant, and I have decided to recognize it as *Hibiscus lasiocarpos* Cav. subsp. *lasiocarpos* var. *occidentalis* (Torr.) A.Gray. Its nomenclatural history follows.

Hibiscus lasiocarpos Cav. var. occidentalis (Torr.) A.Gray, Proceedings of the American Academy of Arts and Sciences 22:303. 1887 [4 Mar 1887] (as "*lasiocarpus* var. *occidentalis*"). —*Hibiscus moscheutos* L. var. *occidentalis* Torr., United States Exploring Expedition, Phanerogams. Pacific North America 17(2):256. 1874.—Type: USA, California, Sacramento Co., Sacramento Valley, *s.d.*, *Wilkes Expedition 1364* (holotype: NY).—*Hibiscus lasiocarpos* var. *californicus* (Kellogg) L. H. Bailey, The Standard Cyclopedia of Horticulture 1486. 1915.—*Hibiscus californicus* Kellogg, Proceedings of the California Academy of Sciences 4:292. 1873.—Type: USA, California, San Joaquin Co., on island near Middle River bridge, San Joaquin River (Byron-Stockton Hwy) *Alexander & Kellogg 3526* (neotype: CAS; isoneotypes: UC, US)—designated by P. A. Fryxell, Systematic Botany Monographs 25:211 (1988).

This variety continues to be included here within *Hibiscus lasiocarpos* Cav. That species, including the California plants, has recently been treated by Blanchard (2008) as *H. moscheutos* L. subsp. *lasiocarpos* (Cav.) O. J. Blanchard. At least one flora (Gleason and Cronquist 1991) has equated Torrey's California variety with all of *H. lasiocarpos*, calling it *H. moscheutos* var. *occidentalis* Torr. That concept is not accepted here because Torrey's type is from California and clearly represents only the isolated California population here included, following Gray's

example, within *H. lasiocarpos*. While there is some variation in pubescence in these two species, treatments such as Godfrey and Wooton (1981) and Mohlenbrock (1986) use this feature in particular to distinguish these species. Other treatments of the Malvaceae (e.g., Hill 1982) and most world floras use some or many hair characters to distinguish mallow species from one another, as this family has hair types varying from simple to bilateral several-rayed hairs, multi-rayed stellate hairs, glandular hairs, as well as stellate-lepidote hairs in varying combinations and densities that usually remain surprisingly consistent within a taxon. I continue to accept *Hibiscus moscheutos* L. and *Hibiscus lasiocarpos* Cav. as distinct species based primarily on the following characters:

1a. Upper leaf surface glabrous or sparsely pubescent, darker than the densely felty-pubescent lower surface especially when dry; capsules glabrous or sparsely pubescent on sutures; involucral bracts uniformly, minutely canescent . . . . . *Hibiscus moscheutos* L.

1b. Upper leaf surface densely soft-pubescent like the lower surface, and usually similar in color; capsules densely pubescent throughout; involucral bracts densely coarsely pubescent with both short-stellate hairs and longer spreading simple hairs especially near the margins. . . . . *Hibiscus lasiocarpos* Cav.

According to this species concept, the California plants fit within *H. lasiocarpos*. This California variety was distinguished by Bailey as having more uniformly cordate leaves and a less hairy capsule than the typical variety. Furthermore, individuals of this taxon characteristically produce long starchy rhizomes from which they often propagate themselves in their native habitat, marshes and deltaic areas subject to unreliable water levels (e.g., Sacramento, 28 Sep 1989, *C. M. Richard 098928* [OAKL: 4 sheets]). This variety often exceeds 2 m in height, and the capsules are globose and 2.5–3 cm, whereas the typical variety normally grows to 2 m or less (not infrequently <1 m tall) and has subglobose or short-cylindic capsules 2–2.5 cm long.

Lavatera vs. *Malva*

The genera *Lavatera* L. and *Malva* L. have undergone a significant revision since the publication of TJM1. Studies by Ray (1994, 1995) on nuclear rDNA Internal Transcribed Spacer (ITS) sequence data as well as morphological features led to the conclusion that the species of *Malva* and *Lavatera* are all closely related, and that a significant number of species assigned to both genera were more closely related to one another than previously thought. In particular, several species in *Lavatera* were found to be more closely related to *Malva sylvestris* L., the type species of *Malva*, than they were to *Lavatera trimestris* L., the type species of *Lavatera*, by means of both sets of data. Both genera are still accepted, but circumscriptions have changed, and the closely related taxa could no longer be maintained within two separate genera. Therefore, the realignment of species within *Lavatera* had to be formalized. Nomenclature for the species of *Malva* included in TJM1 remain the same.

Ray (1998) chose to maintain both genera with the types as stated above, and he defined them not only by their ITS characters, but also by a series of mericarp features. *Malva* was distinguished from *Lavatera* primarily by its mericarps that 1) are rounded in only the axial direction on the abaxial side, 2) have lateral angles or edges, 3) completely or nearly completely enclose the seed, 4) do not separate readily from the seed, and 5) act as a dispersal unit. This group contains not only cosmopolitan weedy species formerly included in both genera, but also several unusual disjunct taxa in Australia, Baja California, Mexico, and California, USA, that had formerly been treated within the genera *Lavatera* or *Saviniona* Webb & Berthelot.

Ray (1998) proposed new combinations and new names for several of the taxa formerly placed within *Lavatera*. Consequently, all three *Lavatera* species in TJM1 are now considered to belong in *Malva*. Ray (1998) proposed the name *Malva dendromorpha* M. F. Ray as a substitute for *Lavatera arborea* L., as he thought that *Malva arborea* was a name already taken and unavailable. However, the name that he cited, "*Malva arborea* St.-Hil.", was never published (a *Sphalma typographicum* (misprint) in Index Kewensis), and so the next available name, *Malva arborea* (L.) Webb. & Berthelot (1836. Histoire Naturelle des Iles Canaries, pt. 2. Phytographia Canariensis 1:30.) based on the Linnaean name is the correct name in *Malva* and *Malva dendromorpha* M. F. Ray becomes superfluous. Ray (1998) also proposed the name *Malva linnaei* M. F. Ray to replace the name *Lavatera cretica* L., as *Malva cretica* Cav. had already been used for a different plant. However, it was brought to my attention (Hinsley 2009) that the name *Malva pseudolavatera* Webb & Berthelot (1836. Histoire Naturelle des Iles Canaries, pt. 2. Phytographia Canariensis 1:29.) had been proposed as a substitute name for *Lavatera cretica* long before Ray's substitute name, and can be considered to be the correct name for the plant, making Ray's name superfluous. For the third California *Lavatera*, Ray (1998) proposed the new combination *Malva assurgentiflora* (Kellogg) M. F. Ray for the indigenous species formerly called *Lavatera assurgentiflora* Kellogg, and this is now its name in *Malva*. Further study may indicate that there are two distinct subspecies within this coastal

California species as suggested by Philbrick (1980).

Lavatera itself as currently defined (Ray 1998) is only rarely found as an introduced plant in North America and in California in particular. Both *L. olbia* L. and *L. trimestris* L. have been found as waifs in the state (see below). A third species, *Lavatera thuringiaca* L., has been found rarely as an escape in more northern parts of North America.

Additional Malvaceae in the Flora

Iliamna rivularis (Dougl.) Greene was not included in the flora of California in 1993 (Hickman 1993). Two specimens collected by Joseph P. Tracy on August 14, 1939, in Humboldt Co. recently came to light. They had been overlooked for many years and there are no other known records of this native species in California, though it is much more common north of the state. The vouchers for this species are: CALIFORNIA. **Humboldt Co.**: Willow Creek Canyon, along Trinity Highway, in woods near stream, altitude 2500 feet, 14 Aug 1939, *J. P. Tracy 16104* (MO 1191877!, MO 1191878!). It is doubtful that it still exists in the state, but there is always the chance it persists. It should also be sought in Lassen or Modoc counties where there is suitable habitat. *Iliamna latibracteata* Wiggins is well-known from redwood forest regions in Humboldt County, and it differs from *I. rivularis* by its wider bractlets (ca. 1 cm wide and long vs. 2 mm wide × 4.5–6 mm long in *I. rivularis*) and its dense pubescence on the undersides of the leaves (hairs sparse in *I. rivularis*). *Iliamna bakeri* (Jeps.) Wiggins is found in more inland chaparral sites in northern California, and it has more shallowly lobed leaves and shorter (2–5 cm vs. >5 cm), stouter petioles than the other two.

Several species of Malvaceae have become naturalized or have been found as waifs in recent years and are added to the flora.

Anoda pentaschista A. Gray. California: **Imperial Co.**: Collins and Flood, Bard, weed in citrus, two trees involved in 40 acre grove, 9 Sep 1983, *L. Pineda & R.A.Flock s.n.* (CDA 4902, CDA 4903, RSA 327698).

Lagunaria patersonia (Andr.) G. Don. CALIFORNIA. **San Diego Co.**: Camp Pendleton, south of Santa Margarita River, 200 ft west of Stuart Mesa Road, and north of old sewage treatment ponds, elevation 3 m, 21 Jul 2007, *C. Martius 401* (SD 179434!).

Lavatera olbia L. CALIFORNIA. **Orange Co.**: Laguna Canyon, 17 Jun 1994, *O.F.Clarke s.n.* (UCR 120561). **San Francisco Co.**: shrubs to 8 ft. tall, commonly naturalized on non-irrigated waste ground of formerly cultivated garden, Victor Reiter's garden, 1195 Stanyon St., San Francisco, 4 Aug 1970, *T.C. Fuller s.n.* (CDA 5008).

Lavatera trimestris L. CALIFORNIA. **Santa Barbara Co.**: edge of water, Lauro Canyon Reservoir near San Roque Rd., Santa Barbara, 25 Jun 1975, *C. F. Smith 10902* (CDA 5007; RSA 535067). Cited in Smith (1976).

Acknowledgments

I thank Katarina Andreasen and Bruce Baldwin for sharing their data on these plants and for stimulating correspondence concerning these taxa in recent years. Others have also been generous with their time and experience with these plants, including Barbara Ertter, Richard Halse, Stewart Robert Hinsley, Fred Hrusa, Lawrence Janeway, Kanchi Gandhi, Jake Ruygt, and Debra Trock, to mention a few. I would especially like to thank Bruce G. Baldwin and the Lawrence R. Heckard Endowment Fund of the Jepson Herbarium for the funding to visit the UC/JEPS and CAS herbaria to study herbarium specimens in support of my work on several Malvaceae genera for the upcoming revision of the *Jepson Manual: Higher Plants of California*. The UC/JEPS and CAS staff were especially hospitable during my visit and very generous with their time. A continuing grant from the Illinois Department of Transportation is gratefully acknowledged for financial support towards research and publication of these studies

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